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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/637,115	08/08/2003	Haijun Yuan	AVA-P007	3827
47389	7590	06/12/2006	EXAMINER	
PATTERSON & SHERIDAN, LLP 3040 POST OAK BLVD SUITE 1500 HOUSTON, TX 77095			VU, PHU	
			ART UNIT	PAPER NUMBER
			2871	

DATE MAILED: 06/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/637,115	YUAN ET AL	
	Examiner	Art Unit	
	Phu Vu	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 14 February 2006.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                                        |                                                                                         |
|------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                            | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

This action replaces the office action dated 3/15/2006.

### ***Response to Arguments***

Applicant's arguments, with respect to the rejection(s) of claim(s) 1, and 3-14 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Juday, Sorin and Bouevitch.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claim 1, 4-5, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juday 6680797 in view of Sorin 6208774 and further in view of Bouevitch 20030035605.**

**Regarding claims 1 and 7,** Juday teaches a spatial light modulator having a polarization beam splitter (cover figure element 10) having a first face and a second face for receiving a collimated beam and separating a beam into orthogonal polarization states. Juday also teaches a waveplate (cover figure element 12) coupled to the second face of the crystal for rotating the polarization beam by 90 degrees thereby

causing the rotated beam to have the same polarization as the other polarization beam and a liquid crystal device for processing the beams.

Juday fails to disclose the P-polarization beam and rotated S-polarization beam are separate from one another and the beam wastes of the P and S beams located at a center of a liquid crystal cavity, however Sorin discloses a liquid crystal cavity that accepts to P and S polarization beams to provide an optical switching element that operates light independent of polarization thereby overcoming losses inherent to polarization dependent waveguides (see cover fig. and column 1 lines 50-57).

Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to separate P and S beams from one another to provide an optical switching element that operates of light independent of polarization thereby overcoming losses inherent to polarization dependent waveguides.

Juday and Sorin, also fail to teach the beam waists of the P and S polarization beams are located substantially at the center of a liquid crystal cavity of the filter however, Bouevitch discloses that locating a liquid crystal cavity at the beam waist of a laser in order to increase channel bandwidth of the laser (see [0119]). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to locate the beam waist at a liquid crystal cavity in order to increase channel bandwidth.

**Regarding claim 4**, since the polarization states are matched prior with respect to polarization states prior to entering the LC cell than this limitation is met.

**Regarding claim 5** Juday does discloses an optical drain such as a photodetector (see column 3 lines 57-59).

**Regarding claim 11**, Juday discloses a method of using an LC OPM comprising: Separating a collimated beam into a P-polarization and S-polarization beam (fig. 4 element 10); rotating the S-polarization beam by 90 degrees (fig. 4 element 20) and having the same polarization and scanning to filter the spectral information of the S-polarization beam and P-polarization beam by a liquid crystal tunable filter (fig. 4 element 35).

Juday fails to disclose the P-polarization beam and rotated S-polarization beam are separate from one another and the beam wastes of the P and S beams located at a center of a liquid crystal cavity, however Sorin discloses a liquid crystal cavity that accepts to P and S polarization beams to provide an optical switching element that operates o light independent of polarization thereby overcoming losses inherent to polarization dependent waveguides (see cover fig. and column 1 lines 50-57): T

Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to separate P and S beams from one another to provide an optical switching element that operates of light independent of polarization thereby overcoming losses inherent to polarization dependent waveguides, thereby overcoming losses inherent to polarization dependent waveguides.

Juday and Sorin, also fail to teach the beam waists of the P and S polarization beams are located substantially at the center of a liquid crystal cavity of the filter however, Bouevitch discloses that locating a liquid crystal cavity at the beam waist of a laser in order to increase channel bandwidth of the laser (see [0119]). Therefore, at the

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time of the invention it would have been obvious to one of ordinary skill in the art to locate the beam waist at a liquid crystal cavity in order to increase channel bandwidth.

**Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juday in view Soren in view of Bouevitch and further in view of Lee et al US Patent 6522467.**

Regarding claim 6, Juday teaches all the limitations of claim 6 except a bi-cell photodiode having a first cell and a second cell, the first cell for receiving the P polarization beam, the second cell of the bi-cell photodiode receiving the rated S-polarization beam. Lee discloses as prior art a LC tunable filter capable of filtering to input signals (see figure 1 element 26). Juday also discloses use of a photodetector as a means of capturing an output signal. Bi-cell photodetectors are used capturing multiple input sources. It would be obvious to one of ordinary skill in the art to use a bi-cell photodetector having each polarization state going in order reduce processing required to demultiplex the signal. Therefore, at the time of the invention, it would have been obvious to combine Lee's LC tunable filter capable to Juday's invention in order to process multiple inputs separately and also add a bi-cell photo-detector to reduce the need for a means to de-multiplex the output signal.

**Claims 3, 8-10, 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juday in view of Soren in view of Bouevitch and further in view of Chen US PreGrant Publication 2003/0103718 and further in view of Cupolo 5666174.**

process multiple inputs separately and also add a bi-cell photo-detector to reduce the need for a means to de-multiplex the output signal.

**Claims 3, 8-10, 12, 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juday in view of Soren in view of Bouevitch and further in view of Chen US PreGrant Publication 2003/0103718 and further in view of Cupolo 5666174.**

**Regarding claims 3, 8, and 12** Juday teaches all the limitations of claims 3, 8 and 12, except a beam collimator coupled to the first face of the polarizer, the small beam collimator receiving an input beam and collimating the input beam to become a collimated beam. Chen teaches a collimator coupled to a birefringent crystal having an input beam and emitting a collimated beam (see cover figure element 13). Cupolo discloses that collimators are used to minimize divergence of a beam as it propagates through a liquid crystal cell (see column 5 lines 5-11). Regarding claim 3 this collimator is considered to have "minimal space separation" between the polarization states that reduces interference as minimal is a relative term.

Therefore, at the time of the invention, it would have been obvious to one of ordinary skill in the art to add a collimator to minimize divergence of the beam as it propagates through the LC cavity.

**Regarding claims 9 and 13**, matching the alignment of the LC filter in the direction of the liquid crystal (see fig. 4) as the liquid crystal in the filter is aligned as

aligning does not imply any structure as there is no structure set forth without a limitation of exactly how these are aligned, therefore, the device is considered aligned.

**Regarding claims 10 and 14**, Judy disclose a reconfigurable liquid crystal device, therefore this limitation is met as to reorient the LC cells requires application of voltage.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

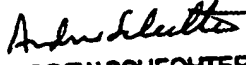


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phu Vu whose telephone number is (571)-272-1562. The examiner can normally be reached on 8AM-5PM M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571)-272-2293. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Phu Vu  
Examiner  
AU 287

  
ANDREW SCHECHTER  
PRIMARY EXAMINER